

Analytical Laboratory Work Group
Asbestos Site Evaluation, Communication, and Cleanup Workshop
September 25, 2003
Workgroup Lead: Terry Smith, EPA

EPA convened a workgroup on September 25, 2003 to discuss limitations in current laboratory asbestos analyses throughout the country and to suggest improvements in future laboratory practices. A key issue revolved around ensuring consistency across all national laboratories, whether via the CLP or through different methods. A summary of the workgroup findings is presented, followed by detailed notes of the workgroup discussions and recommendations.

SUMMARY

Definition of the issues

Laboratories throughout the country have varied abilities in analyzing asbestos fibers. Recent events indicate that some laboratories have questionable asbestos analytical practices. The questionable laboratory practices and differing abilities lead to uncertainty in analytical results. Including asbestos in the CLP would help to minimize the uncertainties, reduce future controversies, and provide analyzing and reporting consistency across the country.

Key personnel/agencies

- EPA: OSRTI, OPPTS, ORD, CEPPPO, Regions
- Others: USGS, OSHA, NIOSH, NIST, states, laboratories

Outcomes/products

- List of audited laboratories and laboratories recommended by Regions
- TEM air SOPs
- Soil analysis SOPs
- Checklist for laboratories/guidelines for analysis to ensure consistency

Resources needed

- Current OSRTI CLP contractors
- IAGs
- USGS

Milestones and timeline

- Terry Smith will provide a current laboratory ability matrix for internal EPA distribution. The matrix will include those laboratories that have completed the audit process and are known to provide more reliable and consistent results for asbestos analysis when compared with other laboratories. Timeline: 2 to 4 weeks.
- Regions will forward a list of the laboratories they have used and trust to Terry Smith. Timeline: As soon as possible
- Ideally, asbestos analysis will be included in the CLP in the future. Timeline: TEM air

- and soil analysis SOPs will take 8 months to one year to develop.
A checklist of recommended laboratory practices will be organized by Terry Smith.
Timeline: not specified.

Volunteers

Terry Smith will coordinate all efforts, with input from EPA Region 8 (and other Regions as identified). Greg Meeker at USGS will remain available to provide assistance, as needed.

CURRENT STATE OF LABORATORIES

EPA Regions need to know which laboratories can provide consistent and reliable asbestos analytical results. Following the influx of “Son of Libby” (SOL) sites, EPA realized there were insufficient laboratories that are qualified and capable of performing asbestos analyses to meet the increased need for such laboratories. Terry Smith conducted an audit of 13 laboratories that answered a “sources sought” notice for laboratories that would be interested in working with EPA in the future. Regions also had the opportunity to refer laboratories to the audit program. All laboratories were already NIST National Voluntary Laboratory Accreditation Program (NVLAP) certified. Following the audits, results were reported back to the Regions.

Terry Smith noted that he would not recommend Regions use laboratories that conduct only PCM analyses. The expertise at these laboratories may be limited. Region 10 may be the only Region that has a combined state/Region lab.

Product

Terry will develop a matrix listing the laboratories that passed the audit, the procedures of each laboratory (PLM, TEM, PCM, SEM), the capacity of the laboratory, and whether or not the laboratory is familiar with Libby-type amphiboles. Terry Smith requested that conference attendees send him a list of laboratories they have worked with and would recommend. If requested by the Regions, future spot audits can be conducted.

ASBESTOS IN CLP

CLP currently has an annual budget of \$30 million, although the future budget may be cut by 10%. EPA management supports adding asbestos to the CLP in the future. Terry Smith estimated that it will take up to one year to incorporate asbestos in the CLP. Ideally, the CLP will include vermiculite attic insulation in the future. If asbestos is added to the CLP, a list of qualified laboratories will be provided to the Regions. The CLP laboratories will follow SOPs as defined by EPA and their services will be at no cost to the Regions. Although the CLP is specific to Superfund work, their services could be negotiated for other programs via buy-ins.

CLP laboratories are limited in the number of samples they can process; however, with the coordination of the field teams all required samples can be scheduled and processed with little difficulty. In addition, most of the laboratories that would likely qualify as CLP labs have satellite labs and could handle extra capacity. The information required for asbestos data validation is much less than that required for chemical data validation.

As with chemical testing, the use of CLP laboratories will not be mandatory.

If asbestos is included in CLP in the future, EPA will need to create SOPs and SOWs. EPA workgroups would be necessary to develop those SOPs, as discussed below.

TEMSOPS

Even if asbestos is not incorporated in CLP, the need exists to develop SOPs for TEM methods to ensure national consistency. ISO 10312 would be a good starting point for developing SOPs, although it would require some modifications for use in situations such as Libby. The AHERA standards are more centered on regulation and have proven limited effectiveness in real-life situations. Region 8 is using a modified AHERA method, but counting the fibers by ISO 10312.

Participants noted that the final air SOPs should be applicable to all fibers, not just Libby-type fibers.

Terry Smith briefly summarized a recent study comparing PE abilities of millipore and neucleopore filters. Earlier studies by Phil Cook found millipore filters had very limited recovery rates, while recent studies demonstrated 80-90% recovery rates for these filters. The recent studies were conducted with a limited sample size. Mike Beard may be able to analyze both studies and provide input.

Product

An EPA workgroup will be convened to develop draft air TEM SOPs. The workgroup should also provide guidance on which fibers should be counted and how the results should be reported.

SOIL ANALYSIS

A small workgroup will be convened to survey current analytical methods (TEM, PLM, SEM) and choose a method to recommend as the preferred soil analysis method. Participants agreed that it will be necessary to develop new SOPs and SOWs for the various methods. Flexibility should be included in any laboratory SOWs to allow for accurate analysis and reporting across different asbestos site types. Region 8 recommended that the SOPs do not require the labs to identify the different forms of amphiboles at the numerous Libby sites (*e.g.*, winchite, richterite), rather they only be required to report “amphibole comparable to Libby type.” In addition, the soil SOPs should allow for different matrices (*e.g.*, mica).

Product

Region 8 will compile a survey of soil analysis methods which will be completed with EPA OSRTI contractor support.

AVAILABLE STANDARDS

Participants reported currently available standards, with additional research to follow. NIST has very few microanalytical standards. The standards they do have are of minimal use, due to limited variety and concentrations for PE and reference samples. EPA will prioritize what is needed and what standards need to be made.

A repository of PE samples is needed for Regions to purchase. NIST is examining certifying other standards from outside sources. All current certified NVLAP have air PE samples. Region 8 is creating and testing soil standards, including calibration materials. VAI and bulk ACM samples do not exist and would be needed if asbestos is included in CLP.

Product

EPA OSRTT's CLP contractor will assist in completing the following table.

Method	Calibration standard	PE standard
TEM/EDS SAED/microscopy (X/Y calibration)	USGS is testing BIR 1G and should have results in 1 month. If not workable, need to identify.	Information needed
SEM/EDS	USGS BIR 1G – basalt glass used for both chrysotile and amphiboles. USGS recommends lab purchase prepared materials	Information needed
PLM	Refractive index oils/Reservoir mixed Libby specific NIST amphibole standards	Information needed
XRD	Unknown, but will get information from USGS	Information needed
PCM	NIST, similar to PLM	Information needed

CHECKLIST FOR LABORATORIES

Participants identified an immediate need for a laboratory checklist to help create national consistency in asbestos testing.

Product

Terry Smith agreed to create a checklist to be distributed to all laboratories conducting asbestos analysis, which would include the following and would help fulfill data validation requirements:

- methodology;
- SOPs;
- standards/samples;
- standardized supplies for each method;
- reference materials;
- QA/QC;
- documentation; and
- chain of custody forms.